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SOURCE Meditsinskiy Rabotnik.

RECENT COMMENTS ON BOSH'YAN'S NEW VIRUS THEORY

The publication of G.M. Bosh'yan's book On the Nature of Viruses and Microbes and of several articles on Bosh'yan's theory has elicited subsequent comments by other investigators in articles appearing on the pages of Meditsinskiy Rabotnik.

In the 17 August 1950 issue of that newspaper, Professor M, Utenkov of Moscow states in an article entitled "Relationships Underlying the Development of Microorganisms" that he and his group have worked for 25 years in the field of microbiology and that the results and conclusions mentioned in this article are based on that work.

According to Utenkov, in early 1950 a special commission investigated 23 preparations, among them tetanus toxin, diphtheria anatoxin, tuberculin, antitetanus serum, antidiphtheria serum, antimeasles serum, BCG vaccine, streptococcus vaccine, Bacilli coli cultures, and yeast cultures. All preparations were autoclaved for 30 minutes at 120°C. After this treatment, 50% of the preparations tested showed development of the invisible forms contained in them into visible cultures. In all cases control tests carried out on nutritive media, equipment, and starting materials established absolute sterility, according to Utenkov.

Utenkov goes on to say that experimental results prove that changes in size, virulence, and specific properties; growth of invisible forms of microorganisms (of viruses, bacterial toxins, bacteria, yeasts, and fungi) into visible modifications; presence of viable invisible forms of microorganisms in preparations which hitherto had been considered sterile; and mistaken assumption of sterility because of the high resistance of microorganisms to external influences are all possible. The phenomena observed in that connection can all be produced by proper modifications of external conditions, he says. He further states that the transmutation of one species of microorganism into another has been unequivocally proven and cites as typical examples the transmutation of virus into bacteria, the transmutation of yeasts into bacteria, and the changes in influenza virus and tetanus toxin which are accompanied by the formation of crystals.

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Utenkov concludes from the experimental material cited by him that microorganisms possess a phylogenetically acquired adaptation characteristic which consists in the ability to assume either the state of normal, active life (biosis), or that of dormancy (anabiosis). Utenkov goes on to say that the anabiotic state enables microorganisms to survive unfavorable conditions. He further states that the small invisible forms which are formed by all bacteria have the dimensions of several tenths of millimicrons, i.e., one-hundredth of the size of the visible forms. All bacteria undergo modifications of size in the course of onthogenesis, he continues, the smallest forms of bacteria being spores, sexual cells, and zygotes. In Utenkov's opinion, the existence of these small and invisible reproductive forms is proven by the nonsterility of autoclaved cultures.

In an article published in the 31 August 1950 issue of Meditsinskiy Rabotnik, Professor A. K. Shubladze, Laureate of the Stalin Prize, comments on Bosh'yan's theory in an article entitled "New Data on the Nature of Viruses." He refers to work carried out in his own laboratory at the Institute of Virology, Academy of Medical Sciences USSR. During the past 2 years, Shubladze, together with M. A. Selimov, investigated the virus of epidemic parotitis. In the course of this work, Shubladze states, it was established that virus isolated from the saliva of patients has the same properties as that isolated from the cerebrospinal liquid of children suffering from parotitic meningoencephalitis. Shubladze goes on to say that white mice could be infected with the virus by introducing it into the respiratory tract.

Shubladze and his group studied the causative factor of epidemic parotitis thoroughly and, by changing the conditions under which cultures were grown, have modified in various ways its physiological and morphological properties. Cultures which formed colonies that were visible under optical magnification by a factor of 1,000-2,000 in the absence of any special treatment improving visibility were obtained, according to Shubladze. These colonies represented aggregations of elementary particles varying in size from 100 to 300 millimicrons. The particles in question occurred individually, in pairs, or in groups of four forming chains and other combinations. Under changing external conditions, the elementary particles undergo morphological modifications, according to the observations reported by Shubladze.

The process of morphological modification, as described by Shubladze, starts with the formation of long, drawn-out threads. The next stage consists in the formation of rod-shaped and round forms merging into each other. Formation of spheres representing accumulations of smaller grains which correspond to elementary particles was also observed. Under appropriate conditions, crystallization of the virus takes place under formation in various stages of threads, needles, stars, and hexagons, just as described by Bosh'yan. Shubladze further states that the virus cultures did not lose their specificity upon crystallization. The titers, as determined by infection of chicken embryos with various virus dilutions, were found to increase by a factor of from 10 to 100. In the course of this work, Shubladze and his collaborators repeatedly observed growth of parotitis cultures in artificial nutritive media and the presence of granularity, crystals, and bacterial forms.

Shubladze reports that V. D. Solov'yev's investigations on the changes which the influenza virus is capable of undergoing were continued in Shubladze's laboratory. The results of this work were approximately the same as those obtained with parotitis virus. The infective, hemagglutinative, toxic, and serological properties of influenza virus did not change as a result of crystallization and were fully conserved. Shubladze states that they could be differentiated from the corresponding properties of parotitis virus. Using the same methods of cultivation, several other virus cultures were obtained in visible forms, he says. Thus, profuse visible cultures of spring-summer encephalitis were obtained by O. G. Anzhaparidze in Shubladze's laboratory, and investigated in regard to their morphology and specificity.

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S. Ya. Gaydamovich obtained crystallizing cultures of the viruses of herpes encephalitis and infectious ectromelia (smallpox of mice). In the course of the investigations described by Shubladze, general relationships which seemed to be valid for the morphological changes occurring in all viruses were noted. In enumerating the sequence of forms, which on the basis of work done at Shubladze's institute may in his opinion be inferred to occur quite generally, Shubladze mentions proliferation of elementary particles, formation of threads or chains from them, formation of small spheres and then large spheres, formation of crystals, and finally appearance of microbes.

According to a further statement made by Shubladze, Bosh'yan's assumption to the effect that reversible transmutation of viruses into microbes generally occurs is at present being investigated experimentally at Shubladze's laboratory. While the experimental material accumulated at this stage is somewhat inadequate to permit a definite conclusion, the perspectives for an experimental confirmation of Bosh'yan's essential thesis look quite promising, in the opinion of Shubladze.

/According to Vestnik Akademii Meditsinskikh Nauk SSSR, No 4, 1948, A. K. Shubladze, together with Professors M. S. Margulis and V. D. Solov'yev, did research in 1940 - 1947 on acute encephalomyelitis (demyelinating encephalitis) and multiple sclerosis. These investigators isolated the virus of the first disease and established its identity with the virus of the second disease. As a result of this work, a specific serum to be used in the therapy of both diseases was developed./

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